

# HB-Therm<sup>®</sup>

## THERMO-5

Temperature Control Units

USA-Edition 2024-01



# Temperature Control Units Thermo-5

Regulated mould temperatures are essential for plastics injection moulding.

Temperature control units regulate mould temperatures through a liquid heat carrier by controlled inducing or dissipating of heat.

Thermo-5 units provide efficient and reliable operation and are used to control temperatures in injection moulding or similar processes.

# HB-Therm<sup>®</sup>

## THERMO-5

### *...precise, powerful and efficient*

Highly accurate temperature control


- $\pm 0.1$  °F with self-optimizing regulation
- Calibration of temperature, pressure and flow rate measurement
- Quality inspection certificate

Short heating and cooling times

- The tankless system tempers only as much heat carrier as necessary

Uses lower heating and cooling energy

- Minimal circulation volume requires less power
- Clever cooling concept reduces losses

Energy efficient pump – Eco-pump  \*

- Energy savings by variable speed pump

### *...easy, intelligent and convenient*

Simple operation

- Well-arranged menus in 21 languages
- Intuitive navigation
- On-the-spot instructions at the push of a button

Bright display

- Easily legible with high contrast
- Free choice of display windows and values

Convenient functions

- Fully automated mould cooling and evacuation \*
- Recording of data via USB and analysis in Excel
- Store function for mould specific parameters
- Control also via the machine

### *...safe, reliable and low on maintenance*

Fully automated process monitoring

- Continuous monitoring of temperature, flow and pressure
- Highly accurate ultrasonic flow rate measurement
- Detection of hose ruptures and leaks
- Pump status is monitored \*

Durable construction

- Solely non-corroding materials in the hydraulic circuit
- Heating elements without direct contact to the heat transfer medium
  - ▶ Lifetime warranty on the heater
- Bypass and proportional valve result in vaporisation-free cooling and low-scaling \*
- Sealless pump in stainless steel

Improved protection for the mould

- Closed system without oxygen contact
- Completely automatic purging of air
- Active regulation of pressure – only as much as necessary \*

### *...small, clean and quiet*

Squeezes into almost everywhere

- Made possible by ingenious hydraulic modules and a tankless system

Can also be used in a clean room \*

- Fibre-free insulation, abrasion resistant castors and high-gloss finish

Draws attention only when necessary

- Intelligent monitoring of all processes



\* Some features may not apply, depending on the model

Some models of Thermo-5 temperature control units have already been replaced by the latest Thermo-6 generation.





**Standard Equipment**

<b>Hydraulics</b>	Closed system without oxygen contact, with efficient automatic deaeration, automatic filling Temperature measurement in main line and return line with sensor Pt 1000 Continuous maintenance-free ultrasonic flow meter Low-scaling and pressure shock-free cooling with cooling water filter and proportional valve Proportionally controlled cooler bypass (on units over 212 °F) Sealless pump in stainless steel Hydraulic circuit made of non-corroding materials Heating elements without direct contact to the heat transfer medium Easy to modify for separate supply of system water (on water units) Booster pump for system filling (on water units over 212 °F) Controlled superimposed system pressure (on water units) Bypass and return line filter Heat transfer circuit with superimposed cold oil (on oil units) Tank with level measuring for expansion and mould evacuation (on oil units)
<b>Functions</b>	Mould emptying by pump reversal (not possible with: <b>8R</b> ) Even load distribution at all heating stages with solid-state relays Auto-tuning cascade control Control on either main line or return line (or external sensor <b>ZE</b> ) Cooling with automatic switch-off programme Change-over to second nominal value Nominal value ramp and ramp programme Cyclical system water exchange (selectable)
<b>Monitoring / Safety</b>	Automatic limit value setting Monitoring of various process parameters Hose rupture and leakage monitor Sensor failure monitor Pump and heater current monitor Dry-running protection Triple safety cut-out for heating Pressure enabling with device OFF (not possible with: <b>8R</b> ) Safety relief valve and pressure gauge on rear of unit Automatic phase direction adaptation and phase monitor Lockable and abrasion resistant castors (PUR)
<b>Command / Display</b>	TFT-Colour display 3,5" with interactive user guidance in 21 languages Help button with context sensitive information Display of flow rate, pump pressure, process power and energie savings Large choice of display windows and values Temperature display in 0.1 °F Units of measurement for temperature, flow rate and pressure can be set Visual and acoustic alarms; volume adjustable Store function for mould specific parameters Display of date and time Timer Operating hours counter and service interval display Logbook for alarms Data input password protected
<b>Interface</b>	USB Connection (Host/Device) for software updates, parameter transfer and data recording HB HB-Therm data interface CAN to connect modular units, flow meters Flow-5 and switching units Vario-5 (1 socket Sub-D 15 pin, female)

Note: Modular units do not have a proper command

**Additional Equipment**

<b>ZL Leak stopper</b>	With automatic vacuum optimisation (up to 158 °F, not possible with: <b>B2</b> )
<b>ZB Connection for alarm and external control</b>	Alarm using potential-free contact (rating max. 250 VAC, 4 A) Unit ON/OFF, ramp programme ON/OFF and switching nominal value 1 or 2 using potential-free contact 1 socket Harting Han 7D (male), connecting cable 6 m with plug included
<b>ZE Connection for external sensor</b>	Thermocouple type J, K, T or Pt 100 in 3-wire system, with selectable production detector 1 socket Audio 5 pin (female), connector 90° (male) included
<b>ZD Interface DIGITAL</b>	Serial data interface 20 mA, RS-232 or RS-422/485 Various protocols selectable: Arburg, Billion, Bühler, Dr. Boy, Engel, Ferromatik Milacron, Haitian, KraussMaffei, MODBUS (RTU-Mode), Negri Bossi, SPI (Fanuc, etc.), Stork, Sumitomo Demag, Wittmann Battenfeld, Zhafr 2 sockets Sub-D 25 pin (female)
<b>ZC Interface CAN</b>	Serial data interface CAN-bus (Sumitomo Demag) and CANopen (EUROMAP 66; Netstal, etc.) To remotely control singular units 2 sockets Sub-D 9 pin (1 male and 1 female)
<b>ZO Interface OPC UA</b>	Ethernet interface (EUROMAP 82.1) 1 socket RJ-45 (female)
<b>ZP Interface PROFIBUS-DP</b>	Serial data interface PROFIBUS-DP 1 Sub-D 9-pin socket (not possible with: <b>ZC</b> )
<b>ZU Pump status monitor</b>	Additional pressure sensor in main line
<b>ZK Keyboard-protection</b>	Transparent flap over display and controls
<b>ZR Clean room package</b>	Clean room capable version: 'At Rest' < ISO class 6 (US class 1 000) 'In Operation' ISO class 7 (US class 10 000) Fibre-free insulation
<b>ZG Mould evacuation with compressed air</b>	Replaces mould evacuation by pump reversal Connection, compressed air (P. 16, Fig. 5) Pressure: 29–116 psi; Thread: G¼; Resistance: 145 psi, 212 °F

**Singular Unit**



**Modular Unit**



Temperature control units Thermo-5 are available as singular or modular units. Contrary to singular units, modular units do not have a proper command and display. They can only be controlled via a singular unit or a control module Panel-5 but thus enable a common changing of parameters as well as a remote control. The units are linked to the master and among each other always via the interface HB. Further, modular units have a cost advantage over the singular units and are distinguished from the latter by adding the letter M to the unit designation (e. g. HB-140ZM2).

Communication (P. 13, Fig. 1)

212 °F

Single units  
Water, direct cooling

Temperature control unit	Heat transfer medium	Water						
	Cooling	Direct						
Type		HB-100X						
	Housing size (P. 16, Fig. 5)	1	1L	2	2L	3	4	
	with maximum main line temperature in °F	212	212	212	212	212	212	
<b>Heating</b> (P. 14, Fig. 2)	kW	●	●					
	8			●	●	●	●	
	16					○	○	
<b>Pump</b> (60 Hz; all pumps are in stainless steel; P. 14, Fig. 3)	sealless (0,6 kW; 35 L/min, 68 m) 0.8 hp; 9.2 gpm, 99 psi	2M	●		●			
	sealless (1,1 kW; 55 L/min, 70 m) 1.5 hp; 15 gpm, 102 psi	4M	○		○ <sup>1)</sup>		○	
	Eco-pump  , sealless (1,1 kW; 60 L/min, 70 m) 1.5 hp; 16 gpm, 102 psi	4S		●		●		
	(2,8 kW; 110 L/min, 70 m) 3.8 hp; 29 gpm, 102 psi	6G					●	
	sealless (2,8 kW; 110 L/min, 70 m) 3.8 hp; 29 gpm, 102 psi	6M					○	
	(4,0 kW; 160 L/min, 70 m) 5.4 hp; 42 gpm, 102 psi	8G					○	
	sealless (4,0 kW; 160 L/min, 70 m) 5.4 hp; 42 gpm, 102 psi	8M					○	
	Eco-pump  , sealless (2,2 kW; 220 L/min, 65 m) 3 hp; 58 gpm, 94 psi	8R						●
	<b>Cooling</b> (P. 15, Fig. 4)	(38 kW @ 60 K) 11 tons @ 108 °F	B1	●	●	●	●	
		(110 kW @ 60 K) 31 tons @ 108 °F	E1					●
<b>Additional Equipment</b>	Connection for alarm and external control	ZB	○	○	○	○	○	
	Connection for external sensor	ZE	○	○	○	○	○	
	Interface DIGITAL	ZD	○	○	○	○	○	
	Interface CAN	ZC	○	○	○	○	○	
	Interface OPC UA	ZO	○	○	○	○	○	
	Interface PROFIBUS-DP	ZP	○	○	○	○	○	
	Pump status monitor	ZU	○	●	○	●	○	●
	Keyboard-protection	ZK	○	○	○	○	○	○
	Clean room package	ZR	○	○	○	○	○	○
	Mould evacuation with compressed air	ZG	○ <sup>2)</sup>	○ <sup>2)</sup>	○ <sup>2)</sup>	○ <sup>2)</sup>	○ <sup>2)</sup>	○ <sup>2)</sup>
	<b>Mains voltage</b>	460 V (440–480 V), 60 Hz; 3LPE	466	●	●	●	●	●
400 V (380–415 V), 60 Hz (50/60 Hz); 3LPE		406	○	○	○	○	○	
210 V (200–220 V), 60 Hz (50/60 Hz); 3LPE		216	○	○	○	○	○	

Ordering example: HB-100X2L-16-4S-B1-ZD, 466, English

● Standard specification ○ Optional <sup>1)</sup> Typical specification  
<sup>2)</sup> Only possible through the cooling water outlet  
 □ Replaced by Thermo-6

Flow rate measurement	Measuring range	gpm	0.1–10.6	0.1–10.6	0.1–10.6	0.1–10.6	0.5–42	0.5–53
Circulating volume in unit	approx.	gal	0.26	0.26	0.42	0.42	1.7	1.7
Dimensions (P. 16, Fig. 5)	Height	in	20.1	20.1	27.6	27.6	33.5	25.6
	Width	in	7.1	7.1	9.4	9.4	11.8	15.8
	Depth	in	26	28.8	26	28.8	38.7	41.9
Weight max.		lbs	110	121	137	150	300	309
Connection, main line and return line	Thread		G¾	G¾	G¾	G¾	G1 ¼	G1 ¼
	Resistance	psi, °F	290, 248	290, 248	290, 248	290, 248	290, 248	290, 248
Connection, cooling water	Pressure	psi	29–72	29–72	29–72	29–72	29–72	29–72
	Thread		G¾	G¾	G¾	G¾	G¾	G¾
	Resistance	psi, °F	145, 212	145, 212	145, 212	145, 212	145, 212	145, 212
Connection, drain	Thread		G¾	G¾	G¾	G¾	G½	G½

212 °F

Single units  
Water, indirect cooling

Temperature control unit	Heat transfer medium	Water						
	Cooling	Indirect						
Type		HB-100Z						
	Housing size (P. 16, Fig. 5)	1	1L	2	2L	3	4	
	with maximum main line temperature in °F	212	212	212	212	212	212	
<b>Heating</b> (P. 14, Fig. 2)	kW	●	●					
	8			●	●	●	●	
	16					○	○	
<b>Pump</b> (60 Hz; all pumps are in stainless steel; P. 14, Fig. 3)	sealless (0,6 kW; 35 L/min, 68 m) 0.8 hp; 9.2 gpm, 99 psi	2M	●		●			
	sealless (1,1 kW; 55 L/min, 70 m) 1.5 hp; 15 gpm, 102 psi	4M	○		○ <sup>1)</sup>		○	
	Eco-pump  , sealless (1,1 kW; 60 L/min, 70 m) 1.5 hp; 16 gpm, 102 psi	4S		●		●		
	(2,8 kW; 110 L/min, 70 m) 3.8 hp; 29 gpm, 102 psi	6G					●	
	sealless (2,8 kW; 110 L/min, 70 m) 3.8 hp; 29 gpm, 102 psi	6M					○	
	(4,0 kW; 160 L/min, 70 m) 5.4 hp; 42 gpm, 102 psi	8G					○	
	sealless (4,0 kW; 160 L/min, 70 m) 5.4 hp; 42 gpm, 102 psi	8M					○	
	Eco-pump  , sealless (2,2 kW; 220 L/min, 65 m) 3 hp; 58 gpm, 94 psi	8R						●
	<b>Cooling</b> (P. 15, Fig. 4)	(30 kW @ 60 K) 8.5 tons @ 108 °F	A2	●	●	●	●	
		(50 kW @ 60 K) 14 tons @ 108 °F	B2	○	○	○	○	
(90 kW @ 60 K) 26 tons @ 108 °F		C2					●	
<b>Additional Equipment</b>	Leak stopper	ZL	○ <sup>3)</sup>	○ <sup>3)</sup>	○ <sup>3)</sup>	○ <sup>3)</sup>		
	Connection for alarm and external control	ZB	○	○	○	○	○	
	Connection for external sensor	ZE	○	○	○	○	○	
	Interface DIGITAL	ZD	○	○	○	○	○	
	Interface CAN	ZC	○	○	○	○	○	
	Interface OPC UA	ZO	○	○	○	○	○	
	Interface PROFIBUS-DP	ZP	○	○	○	○	○	
	Pump status monitor	ZU	○	●	○	●	○	●
	Keyboard-protection	ZK	○	○	○	○	○	○
	Clean room package	ZR	○	○	○	○	○	○
	Mould evacuation with compressed air	ZG	○	○	○	○	○	○
<b>Mains voltage</b>	460 V (440–480 V), 60 Hz; 3LPE	466	●	●	●	●	●	
	400 V (380–415 V), 60 Hz (50/60 Hz); 3LPE	406	○	○	○	○	○	
	210 V (200–220 V), 60 Hz (50/60 Hz); 3LPE	216	○	○	○	○	○	

Ordering example: HB-100Z2L-16-4S-B2-ZE, 466, English

● Standard specification ○ Optional <sup>1)</sup> Typical specification  
<sup>3)</sup> Not possible with: B2 □ replaced by Thermo-6

Flow rate measurement	Measuring range	gpm	0.1–10.6	0.1–10.6	0.1–10.6	0.1–10.6	0.5–42	0.5–53
Circulating volume in unit	approx.	gal	0.32	0.32	0.48	0.48	1.7	1.7
Dimensions (P. 16, Fig. 5)	Height	in	20.1	20.1	27.6	27.6	33.5	25.6
	Width	in	7.1	7.1	9.4	9.4	11.8	15.8
	Depth	in	26	28.8	26	28.8	38.7	41.9
Weight max.		lbs	115	126	141	155	324	331
Connection, main line and return line	Thread		G¾	G¾	G¾	G¾	G1 ¼	G1 ¼
	Resistance	psi, °F	290, 248	290, 248	290, 248	290, 248	290, 248	290, 248
Connection, cooling water	Pressure	psi	29–72	29–72	29–72	29–72	29–72	29–72
	Thread		G¾	G¾	G¾	G¾	G¾	G¾
	Resistance	psi, °F	145, 212	145, 212	145, 212	145, 212	145, 212	145, 212
Connection, separate system water	Pressure	psi	29–72	29–72	29–72	29–72	29–72	29–72
	Thread		G¾	G¾	G¾	G¾	G½	G½
	Resistance	psi, °F	145, 212	145, 212	145, 212	145, 212	145, 212	145, 212
Connection, drain	Thread		G¾	G¾	G¾	G¾	G½	G½

284 °F

Single units  
Water, indirect cooling

Temperature control unit	Heat transfer medium	Water						
		Indirect						
Type		HB-140Z						
	Housing size (P. 16, Fig. 5)	1	1L	2	2L	3	4	
	with maximum main line temperature in °F	284	284	284	284	284	284	
<b>Heating</b> (P. 14, Fig. 2)	kW	●	●					
	8			●	●	●	●	
	16					○	○	
<b>Pump</b> (60 Hz; all pumps are in stainless steel; P. 14, Fig. 3)	sealless (0,6 kW; 35 L/min, 68 m) 0.8 hp; 9.2 gpm, 99 psi	●		●				
	sealless (1,1 kW; 55 L/min, 70 m) 1.5 hp; 15 gpm, 102 psi	○		○ <sup>1)</sup>		○		
	Eco-pump  , sealless (1,1 kW; 60 L/min, 70 m) 1.5 hp; 16 gpm, 102 psi		●		●			
	(2,8 kW; 110 L/min, 70 m) 3.8 hp; 29 gpm, 102 psi					●		
	sealless (2,8 kW; 110 L/min, 70 m) 3.8 hp; 29 gpm, 102 psi					○		
	(4,0 kW; 160 L/min, 70 m) 5.4 hp; 42 gpm, 102 psi					○		
	sealless (4,0 kW; 160 L/min, 70 m) 5.4 hp; 42 gpm, 102 psi					○		
	Eco-pump  , sealless (2,2 kW; 220 L/min, 65 m) 3 hp; 58 gpm, 94 psi						●	
	<b>Cooling</b> (P. 15, Fig. 4)	(30 kW @ 60 K) 8.5 tons @ 108 °F	●	●	●	●	●	
		(50 kW @ 60 K) 14 tons @ 108 °F			○	○	○	●
(90 kW @ 60 K) 26 tons @ 108 °F						○	○	
<b>Additional Equipment</b>	Leak stopper	○	○	○ <sup>3)</sup>	○ <sup>3)</sup>			
	Connection for alarm and external control	○	○	○	○	○	○	
	Connection for external sensor	○	○	○	○	○	○	
	Interface DIGITAL	○	○	○	○	○	○	
	Interface CAN	○	○	○	○	○	○	
	Interface OPC UA	○	○	○	○	○	○	
	Interface PROFIBUS-DP	○	○	○	○	○	○	
	Pump status monitor	○	●	○	●	○	●	
	Keyboard-protection	○	○	○	○	○	○	
	Clean room package	○	○	○	○	○	○	
Mould evacuation with compressed air	○	○	○	○	○	○		
<b>Mains voltage</b>	460 V (440–480 V), 60 Hz; 3LPE	●	●	●	●	●	●	
	400 V (380–415 V), 60 Hz (50/60 Hz); 3LPE	○	○	○	○	○	○	
	210 V (200–220 V), 60 Hz (50/60 Hz); 3LPE	○	○	○	○	○	○	

Ordering example: HB-140Z2L-16-4S-A2-ZE-ZD, 466, English

● Standard specification ○ Optional <sup>1)</sup> Typical specification  
<sup>3)</sup> Not possible with: B2 □ replaced by Thermo-6

Flow rate measurement	Measuring range	gpm	0.1–10.6	0.1–10.6	0.1–10.6	0.1–10.6	0.5–42	0.5–53
Circulating volume in unit	approx.	gal	0.4	0.4	0.55	0.55	1.7	1.7
Dimensions (P. 16, Fig. 5)	Height	in	20.1	20.1	27.6	27.6	33.5	25.6
	Width	in	7.1	7.1	9.4	9.4	11.8	15.8
	Depth	in	26	28.8	26	28.8	38.7	41.9
Weight max.		lbs	121	133	148	161	342	353
Connection, main line and return line	Thread		G¾	G¾	G¾	G¾	G1 ¼	G1 ¼
	Resistance	psi, °F	290, 320	290, 320	290, 320	290, 320	290, 320	290, 320
Connection, cooling water	Pressure	psi	29–72	29–72	29–72	29–72	29–72	29–72
	Thread		G¾	G¾	G¾	G¾	G¾	G¾
	Resistance	psi, °F	145, 212	145, 212	145, 212	145, 212	145, 212	145, 212
Connection, separate system water	Pressure	psi	29–72	29–72	29–72	29–72	29–72	29–72
	Thread		G¾	G¾	G¾	G¾	G½	G½
	Resistance	psi, °F	145, 212	145, 212	145, 212	145, 212	145, 212	145, 212
Connection, drain	Thread		G¾	G¾	G¾	G¾	G½	G½

320 °F

Single units  
Water, indirect cooling

Temperature control unit	Heat transfer medium	Water						
		Indirect						
Type		HB-160Z						
	Housing size (P. 16, Fig. 5)	1	1L	2	2L	3	4	
	with maximum main line temperature in °F	320	320	320	320	320	320	
<b>Heating</b> (P. 14, Fig. 2)	kW	●	●					
	8			●	●	●	●	
	16					○	○	
<b>Pump</b> (60 Hz; all pumps are in stainless steel; P. 14, Fig. 3)	sealless (0,6 kW; 35 L/min, 68 m) 0.8 hp; 9.2 gpm, 99 psi	●		●				
	sealless (1,1 kW; 55 L/min, 70 m) 1.5 hp; 15 gpm, 102 psi	○		○ <sup>1)</sup>		●		
	Eco-pump  , sealless (1,1 kW; 60 L/min, 70 m) 1.5 hp; 16 gpm, 102 psi		●		●			
	(2,8 kW; 110 L/min, 70 m) 3.8 hp; 29 gpm, 102 psi					○ <sup>1)</sup>		
	sealless (2,8 kW; 110 L/min, 70 m) 3.8 hp; 29 gpm, 102 psi					○		
	(4,0 kW; 160 L/min, 70 m) 5.4 hp; 42 gpm, 102 psi					○		
	sealless (4,0 kW; 160 L/min, 70 m) 5.4 hp; 42 gpm, 102 psi					○		
	Eco-pump  , sealless (2,2 kW; 220 L/min, 65 m) 3 hp; 58 gpm, 94 psi						●	
	<b>Cooling</b> (P. 15, Fig. 4)	(30 kW @ 60 K) 8.5 tons @ 108 °F	●	●	●	●	●	
		(50 kW @ 60 K) 14 tons @ 108 °F			○	○	○	●
(90 kW @ 60 K) 26 tons @ 108 °F						○	○	
<b>Additional Equipment</b>	Leak stopper	○	○	○ <sup>3)</sup>	○ <sup>3)</sup>			
	Connection for alarm and external control	○	○	○	○	○	○	
	Connection for external sensor	○	○	○	○	○	○	
	Interface DIGITAL	○	○	○	○	○	○	
	Interface CAN	○	○	○	○	○	○	
	Interface OPC UA	○	○	○	○	○	○	
	Interface PROFIBUS-DP	○	○	○	○	○	○	
	Pump status monitor	○	●	○	●	○	●	
	Keyboard-protection	○	○	○	○	○	○	
	Clean room package	○	○	○	○	○	○	
Mould evacuation with compressed air	○	○	○	○	○	○		
<b>Mains voltage</b>	460 V (440–480 V), 60 Hz; 3LPE	●	●	●	●	●	●	
	400 V (380–415 V), 60 Hz (50/60 Hz); 3LPE	○	○	○	○	○	○	
	210 V (200–220 V), 60 Hz (50/60 Hz); 3LPE	○	○	○	○	○	○	


Ordering example: HB-160Z4-16-8R-B2-ZE-ZD, 466, English

● Standard specification ○ Optional <sup>1)</sup> Typical specification  
<sup>3)</sup> Not possible with: B2 □ replaced by Thermo-6

Flow rate measurement	Measuring range	gpm	0.1–10.6	0.1–10.6	0.1–10.6	0.1–10.6	0.5–42	0.5–53
Circulating volume in unit	approx.	gal	0.4	0.4	0.55	0.55	1.7	1.7
Dimensions (P. 16, Fig. 5)	Height	in	20.1	20.1	27.6	27.6	33.5	25.6
	Width	in	7.1	7.1	9.4	9.4	11.8	15.8
	Depth	in	26	28.8	26	28.8	38.7	41.9
Weight max.		lbs	126	137	152	166	342	353
Connection, main line and return line	Thread		G¾	G¾	G¾	G¾	G1 ¼	G1 ¼
	Resistance	psi, °F	290, 356	290, 356	290, 356	290, 356	290, 356	290, 356
Connection, cooling water	Pressure	psi	29–72	29–72	29–72	29–72	29–72	29–72
	Thread		G¾	G¾	G¾	G¾	G¾	G¾
	Resistance	psi, °F	145, 212	145, 212	145, 212	145, 212	145, 212	145, 212
Connection, separate system water	Pressure	psi	29–72	29–72	29–72	29–72	29–72	29–72
	Thread		G¾	G¾	G¾	G¾	G½	G½
	Resistance	psi, °F	145, 212	145, 212	145, 212	145, 212	145, 212	145, 212
Connection, drain	Thread		G¾	G¾	G¾	G¾	G½	G½

356 °F

Single units  
Water, indirect cooling

Temperature control unit	Heat transfer medium			
	Water			
	Indirect			
<b>Type</b>		<b>HB-180Z</b>		
	Housing size (P. 16, Fig. 5)	<b>2</b>	<b>2L</b>	<b>3</b>
	with maximum main line temperature in °F	356	356	356
<b>Heating</b> (P. 14, Fig. 2)	kW	<b>8</b>		
		●	●	
		○ <sup>1)</sup>	○ <sup>1)</sup>	●
		<b>16</b>		
		○		○
		<b>32</b>		
<b>Pump</b> (60 Hz; all pumps are in stainless steel; P. 14, Fig. 3)				
sealless (0,6 kW; 35 L/min, 68 m) 0.8 hp; 9.2 gpm, 99 psi		<b>2M</b>		
sealless (1,1 kW; 55 L/min, 70 m) 1.5 hp; 15 gpm, 102 psi		<b>4M</b>		●
Eco-pump  , sealless (1,1 kW; 60 L/min, 70 m) 1.5 hp; 16 gpm, 102 psi		<b>4S</b>	●	
sealless (2,8 kW; 110 L/min, 70 m) 3.8 hp; 29 gpm, 102 psi		<b>6M</b>		○ <sup>1)</sup>
sealless (4,0 kW; 160 L/min, 70 m) 5.4 hp; 42 gpm, 102 psi		<b>8M</b>		○
<b>Cooling</b> (P. 15, Fig. 4)	(30 kW @ 60 K) 8.5 tons @ 108 °F	<b>A2</b>	●	●
	(50 kW @ 60 K) 14 tons @ 108 °F	<b>B2</b>	○	○
	(90 kW @ 60 K) 26 tons @ 108 °F	<b>C2</b>		○
<b>Additional Equipment</b>				
Connection for alarm and external control		<b>ZB</b>	○	○
Connection for external sensor		<b>ZE</b>	○	○
Interface DIGITAL		<b>ZD</b>	○	○
Interface CAN		<b>ZC</b>	○	○
Interface OPC UA		<b>ZO</b>	○	○
Interface PROFIBUS-DP		<b>ZP</b>	○	○
Pump status monitor		<b>ZU</b>	○	●
Keyboard-protection		<b>ZK</b>	○	○
Clean room package		<b>ZR</b>	○	○
Mould evacuation with compressed air		<b>ZG</b>	○	○
<b>Mains voltage</b>	460 V (440–480 V), 60 Hz; 3LPE	<b>466</b>	●	●
	400 V (380–415 V), 60 Hz (50/60 Hz); 3LPE	<b>406</b>	○	○
	210 V (200–220 V), 60 Hz (50/60 Hz); 3LPE	<b>216</b>	○	○

Ordering example: HB-180Z2-8-4M-A2-ZD-ZU, 466, English


● Standard specification ○ Optional

<sup>1)</sup> Typical specification

Flow rate measurement	Measuring range	gpm	0.1–10.6	0.1–10.6	0.5–42
Circulating volume in unit	approx.	gal	0.55	0.55	1.7
Dimensions (P. 16, Fig. 5)	Height	in	27.6	27.6	33.5
	Width	in	9.4	9.4	11.8
	Depth	in	26	28.8	38.7
Weight max.		lbs	153	166	340
Connection, main line and return line	Thread		G¾	G¾	G1 ¼
	Resistance	psi, °F	363, 392	363, 392	363, 392
Connection, cooling water	Pressure	psi	29–72	29–72	29–72
	Thread		G¾	G¾	G¾
	Resistance	psi, °F	145, 212	145, 212	145, 212
Connection, separate system water	Pressure	psi	29–72	29–72	29–72
	Thread		G¼	G¼	G½
	Resistance	psi, °F	145, 212	145, 212	145, 212
Connection, drain	Thread		G¾	G¾	G¾

392/446 °F

Single units  
Water, indirect cooling

Temperature control unit	Heat transfer medium		
	Water		
	Indirect		
<b>Type</b>		<b>HB-200Z</b>	<b>HB-230Z</b>
	Housing size (P. 16, Fig. 5)	<b>2B</b>	<b>2B</b>
	with maximum main line temperature in °F	392	446
<b>Heating</b> (P. 14, Fig. 2)	kW	<b>16</b>	
		●	●
<b>Pump</b> (60 Hz; all pumps are in stainless steel; P. 14, Fig. 3)			
sealless (0,6 kW; 35 L/min, 68 m) 0.8 hp; 9.2 gpm, 99 psi		<b>2M</b>	●
sealless (1,1 kW; 55 L/min, 70 m) 1.5 hp; 15 gpm, 102 psi		<b>4M</b>	○ <sup>1)</sup>
Eco-pump  , sealless (1,1 kW; 60 L/min, 70 m) 1.5 hp; 16 gpm, 102 psi		<b>4S</b>	○
<b>Cooling</b> (P. 15, Fig. 4)	(30 kW @ 60 K) 8.5 tons @ 108 °F	<b>A2</b>	●
	(50 kW @ 60 K) 14 tons @ 108 °F	<b>B2</b>	○
<b>Additional Equipment</b>			
Connection for alarm and external control		<b>ZB</b>	○
Connection for external sensor		<b>ZE</b>	○
Interface DIGITAL		<b>ZD</b>	○
Interface CAN		<b>ZC</b>	○
Interface OPC UA		<b>ZO</b>	○
Interface PROFIBUS-DP		<b>ZP</b>	○
Pump status monitor		<b>ZU</b>	○ <sup>4)</sup>
Keyboard-protection		<b>ZK</b>	○
Clean room package		<b>ZR</b>	○
Mould evacuation with compressed air		<b>ZG</b>	○
<b>Mains voltage</b>	460 V (440–480 V), 60 Hz; 3LPE	<b>466</b>	●
	400 V (380–415 V), 60 Hz (50/60 Hz); 3LPE	<b>406</b>	○
	210 V (200–220 V), 60 Hz (50/60 Hz); 3LPE	<b>216</b>	○

Ordering example: HB-230Z2B-16-4M-A2-ZE-ZD, 466, English

● Standard specification ○ Optional

<sup>1)</sup> Typical specification <sup>4)</sup> Included with: 4S

Flow rate measurement	Measuring range	gpm	0.1–10.6	0.1–10.6
Circulating volume in unit	approx.	gal	0.42	0.42
Dimensions (P. 16, Fig. 5)	Height	in	27.6	27.6
	Width	in	11.8	11.8
	Depth	in	37.9	37.9
Weight max.		lbs	265	265
Connection, main line and return line	Thread		G¾	G¾
	Resistance	psi, °F	450, 428	682, 482
Connection, cooling water	Pressure	psi	29–72	29–72
	Thread		G¾	G¾
	Resistance	psi, °F	145, 212	145, 212
Connection, separate system water	Pressure	psi	29–72	29–72
	Thread		G¼	G¼
	Resistance	psi, °F	145, 212	145, 212
Connection, drain	Thread		G¾	G¾

392/482 °F

Single units  
Oil, indirect cooling

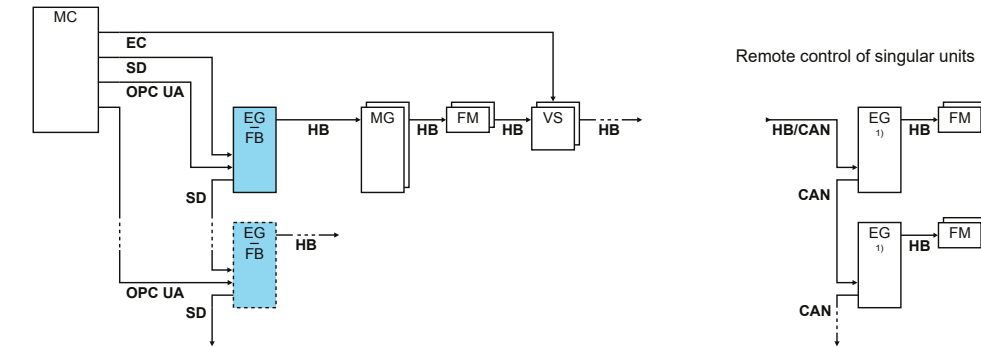
<b>Temperature control unit</b>	Heat transfer medium		Oil
	Cooling		Indirect
<b>Type</b>		<b>HB-200T</b>	<b>HB-250T</b>
	Housing size (P. 16, Fig. 5)	<b>2</b>	<b>3</b>
	with maximum main line temperature in °F	392	482
<b>Heating</b> (P. 14, Fig. 2)	kW	<b>8</b>	<b>16</b>
<b>Pump</b> (60 Hz; all pumps are in stainless steel; P. 14, Fig. 3)			
	sealless (0,6 kW; 35 L/min, 68 m) 0.8 hp; 9.2 gpm, 99 psi	<b>2M</b>	•
	sealless (1,1 kW; 55 L/min, 70 m) 1.5 hp; 15 gpm, 102 psi	<b>4M</b>	○
<b>Cooling</b> (P. 15, Fig. 4)	(34 kW @ 120 K) 10 tons @ 216 °F	<b>A3</b>	•
	(60 kW @ 120 K) 17 tons @ 216 °F	<b>B3</b>	○
<b>Additional Equipment</b>			
	Connection for alarm and external control	<b>ZB</b>	○
	Connection for external sensor	<b>ZE</b>	○
	Interface DIGITAL	<b>ZD</b>	○
	Interface CAN	<b>ZC</b>	○
	Interface OPC UA	<b>ZO</b>	○
	Interface PROFIBUS-DP	<b>ZP</b>	○
	Pump status monitor	<b>ZU</b>	○
	Keyboard-protection	<b>ZK</b>	○
<b>Mains voltage</b>	460 V (440–480 V), 60 Hz; 3LPE	<b>466</b>	•
	400 V (380–415 V), 60 Hz (50/60 Hz); 3LPE	<b>406</b>	○
	210 V (200–220 V), 60 Hz (50/60 Hz); 3LPE	<b>216</b>	○

Ordering example: HB-250T3-8-2M-A3-ZE-ZD-ZU, 466, English

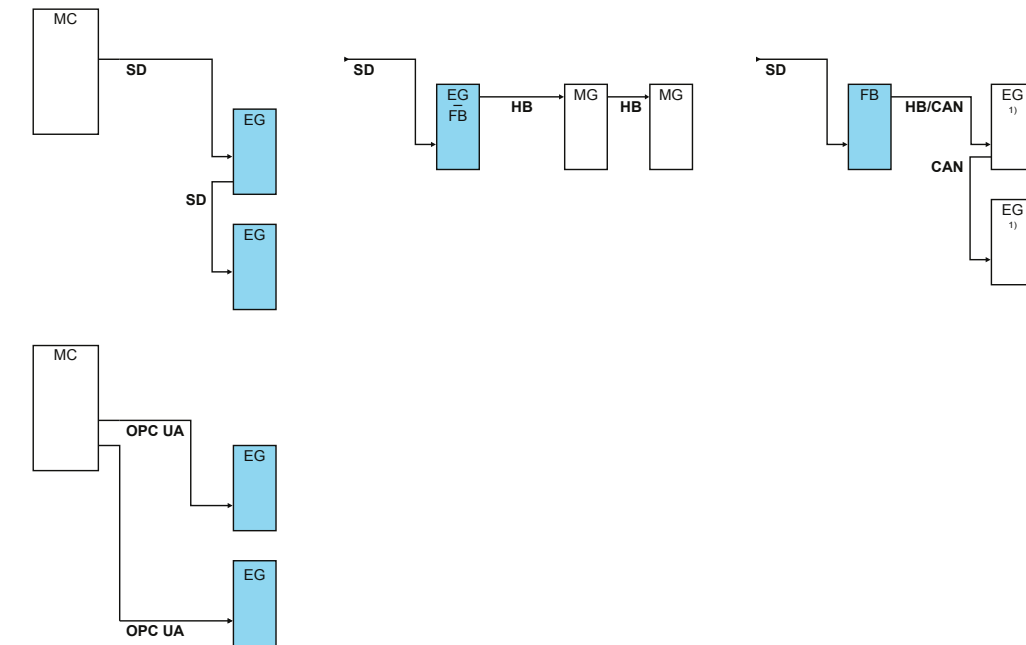
• Standard specification ○ Optional

Flow rate measurement	Measuring range	gpm	0.1–10.6	0.1–10.6
Circulating volume in unit	approx.	gal	0.42	0.92
Volume of internal expansion tank	approx.	gal	1.45	4.0
Dimensions (P. 16, Fig. 5)	Height	in	27.6	33.5
	Width	in	9.4	11.8
	Depth	in	26.9	37.2
Weight max.		lbs	131	223
Connection, main line and return line	Thread		G¾	G¾
	Resistance	psi, °F	145, 428	145, 518
Connection, cooling water	Pressure	psi	29–72	29–72
	Thread		G¾	G¾
	Resistance	psi, °F	145, 212	145, 212
Connection, drain	Thread		G¾	G½

**Communication (Fig. 1)**  
Basic circuit diagram



**Examples**



Legend	Description	Note
MC	Machine control	max. 1
FB	Control modul Panel-5	max. 1
EG	Temperature control unit Thermo-5, singular unit	max. 16 (per command)
MG	Temperature control unit Thermo-5, modular unit	
FM	Flow meter Flow-5	max. 32 (at 4 circuits each)
VS	Switching unit Vario-5	max. 8
<b>SD</b>	Communication via serial data interface DIGITAL ( <b>ZD</b> ), CAN ( <b>ZC</b> ), PROFIBUS-DP ( <b>ZP</b> )	Maximum number of units, operating range and transfer of flow rate values depend on machine control and protocol
<b>OPC UA</b>	Communication OPC UA via Ethernet ( <b>ZO</b> )	
<b>HB</b> <sup>2)</sup>	Communication interface HB	Order of connection is not relevant
<b>HB/CAN</b> <sup>2)</sup>	Communication interface HB/CAN	To remotely control singular units
<b>CAN</b>	Communication interface CAN ( <b>ZC</b> )	
<b>EC</b>	External control	Assignment dependent on machine control unit

■ Command <sup>1)</sup> Command deactivated <sup>2)</sup> max. length cable HB: Total 50 m (164 ft)




**Heating Capacity, Electricity Supply (Fig. 2)**

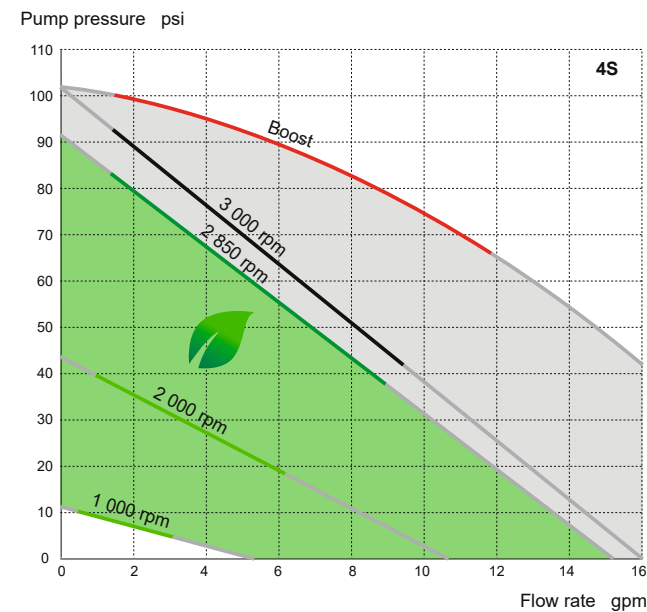
The heating capacity applies at rated voltage (400 V, 460 V or 210 V) and varies max. ±10 % within the range indicated.

Maximum fusing; Cross-section through unit mains cable (with mains voltage)





Heating	400 V or 460 V	210 V
8 kW	3x20 A; 2,5 mm <sup>2</sup> (AWG 12)	3x32 A; 6 mm <sup>2</sup> (AWG 10)
16 kW	3x32 A; 6 mm <sup>2</sup> (AWG 10)	3x63 A; 16 mm <sup>2</sup> (AWG 6)
32 kW	3x63 A; 16 mm <sup>2</sup> (AWG 6)	3x125 A; 50 mm <sup>2</sup> (AWG 1)

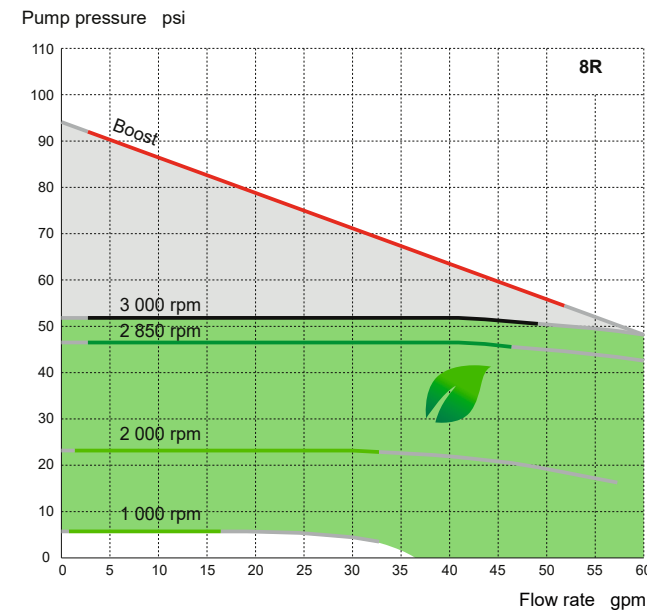
**Pump Capacity Curve (Fig. 3)**

Eco-pump , Variable speed Eco-pump (Energy efficiency class IE4)



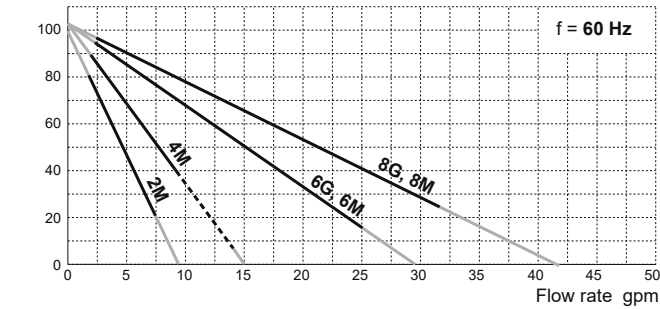
In Eco-mode the unit will control the speed depending on either actual speed or flow rate or pump pressure or temperature difference between main line and return line. Energy savings are announced and registered.

-  Energy savings range
-  High power range
-  Boost-mode (max. speed)
-  Normal operation (2 850 rpm)





**Fixed speed pumps**

Pump pressure psi

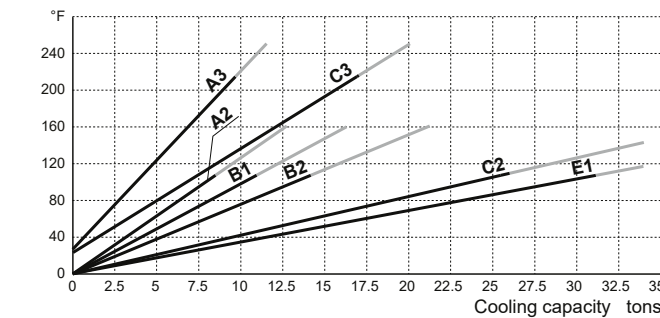


The pump pressures for oil units are different (usually lower) than when using water due to the varying density of the heat transfer oil. Depending on the used oil and the working temperature the density ranges at 70–105 % of that of water. The pump pressures will change to the same degree.

-  Attainable practical values
-  Attainable practical values with housing size 3


**Cooling Capacity (Fig. 4)**

Temperature difference between heat transfer medium and cooling water



Cooling water quantity at 29 psi:

- A2** 3.2 gpm
- A3** 3.7 gpm
- B1** 2.4 gpm
- B2** 4.2 gpm
- C2** 9 gpm
- C3** 4.2 gpm
- E1** 7.1 gpm

-  Attainable practical values  
(max. temperature at cooler outlet approx. 140 °F)

**General Technical Data**

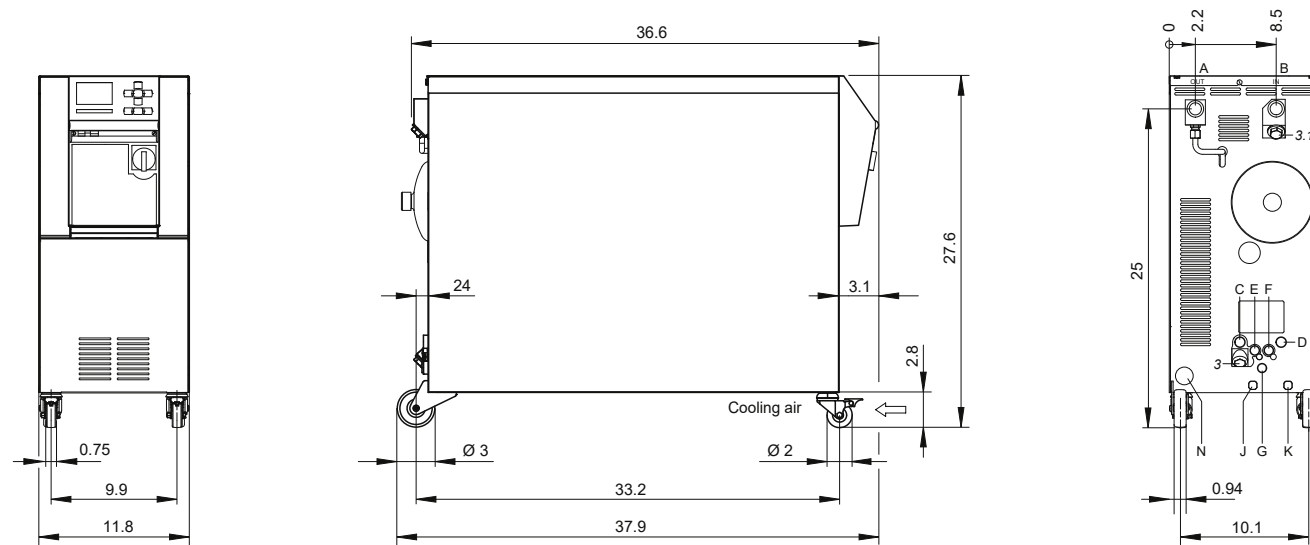
Mains cable to unit	3LPE, 4 m (13.1 ft)
Environment	Temperature range 41–104 °F Relative humidity 35–85 % RH (non-condensing)
Colour	Cover RAL 7035 (glossy light grey), RAL 5012 (glossy light blue) Control panel RAL 7012 (basalt grey) Access cover RAL 7021 (glossy black grey)
Continuous sound pressure level	<70 dB(A)
Protection class	IP 44
Standards (depending on unit type)	EN 12828, EN 12953-6, EN 60204-1, EN 60730-2-9, EN IEC 61000-6-2, EN IEC 61000-6-4, EN ISO 12100, EN IEC 63000, EN ISO 13732-1, DIN 4754
Certification/Approval	CE (compliance with relevant CE directives)
Temperature measurement	Resolution 0.1 °F Control accuracy ±0,2 °F Tolerance ±1.5 °F
Flow rate measurement	Resolution 0.1 gpm Tolerance: Housing size 1, 1L, 2, 2L, 2B ±(5 % of measured value + 0,026 gpm) Tolerance: Housing size 3, 4 ±(5 % of measured value + 0,132 gpm)
Pump pressure indicator	Tolerance ±10 % of rated value





Housing size 2B, scale 1:15

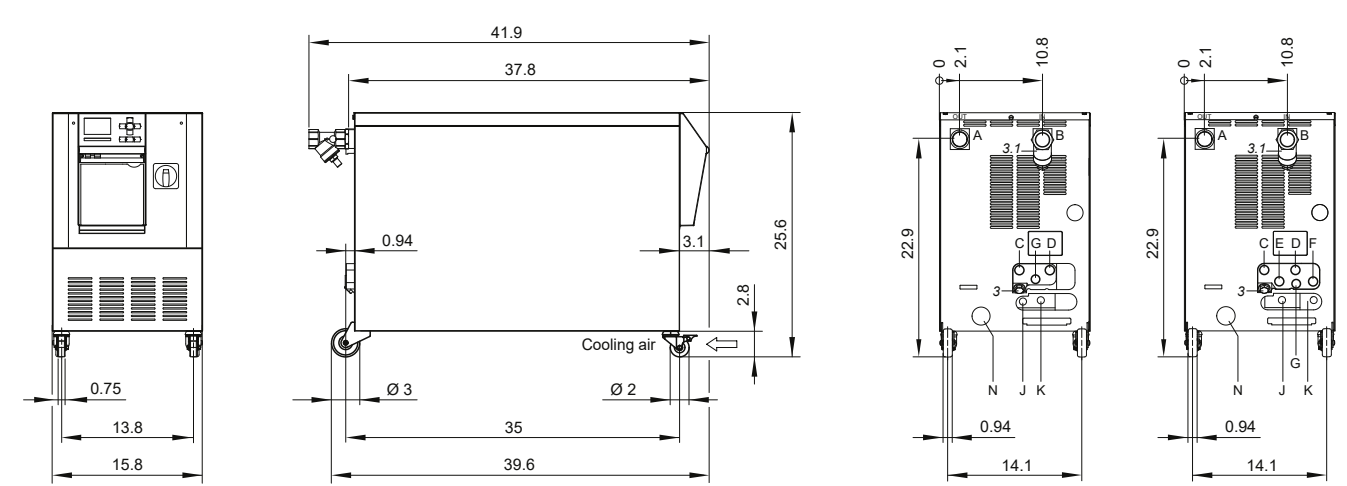
HB-\_\_Z2B



Housing size 4, scale 1:20

HB-100X4

HB-\_\_Z4

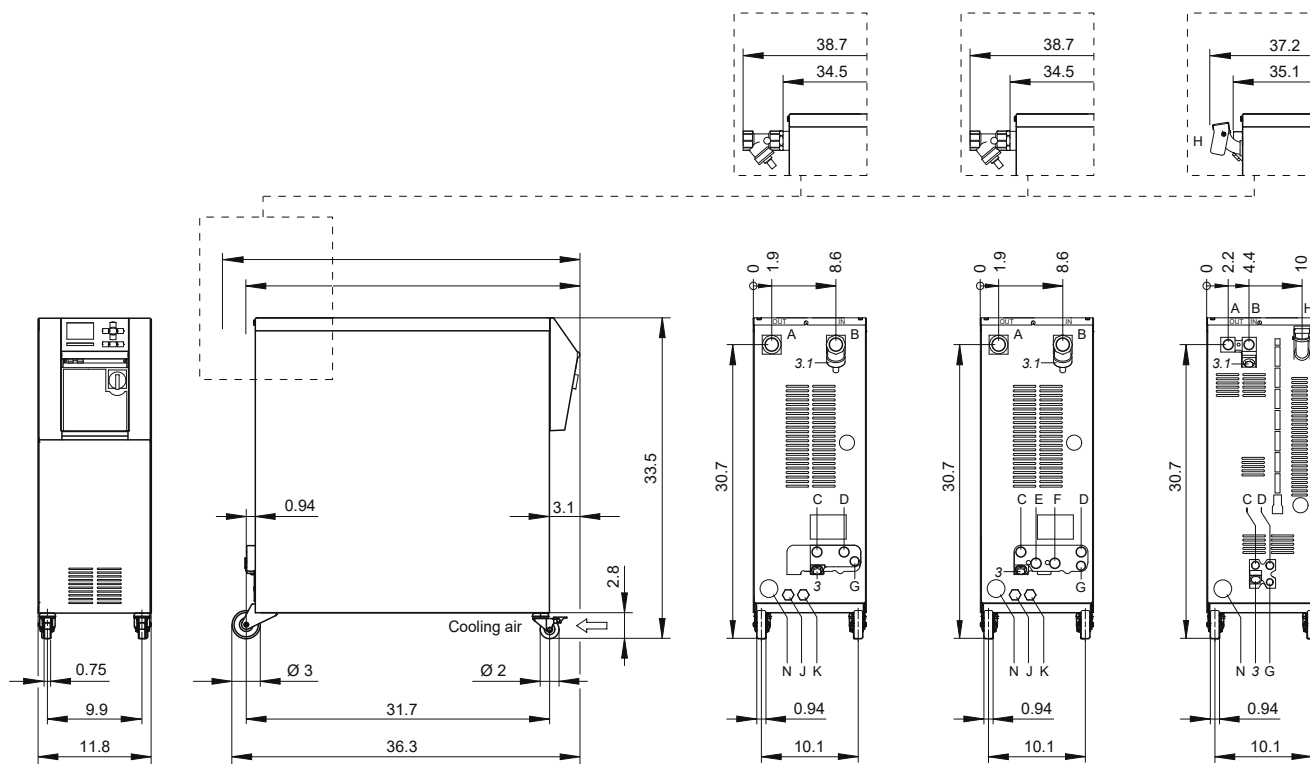


Housing size 3, scale 1:20

HB-100X3

HB-\_\_Z3

HB-250T3



- A Main line
- B Return line
- C Cooling water inlet
- D Cooling water outlet
- E System water inlet
- F System water outlet
- G Drain
- H Filling (on oil units)
- J Compressed air inlet (ZG)
- K Compressed air outlet (ZG)
- N Mains connection cable

- 3 Filter cooling water inlet
- 3.1 Filter return line

Note: 3D data available



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St. Gallen, Switzerland

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